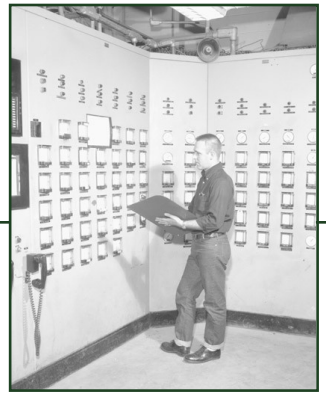
U.S. ARMY CHEMICAL MATERIALS AGENCY

CREATING A SAFER TOMORROW

Non-Stockpile Non-Intrusive Assessment Technologies



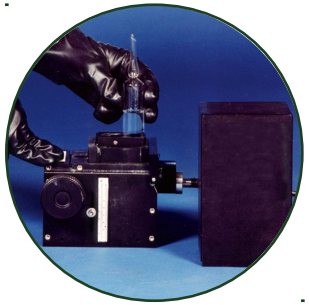
Throughout the 20th century, chemical weapons played an important role supporting our national defense, serving as a deterrent to the use of chemical weapons by other nations.

In some cases, the U.S. Army disposed of chemical warfare items by burial, an approved
and internationally accepted disposal method until the 1970s.

Now, chemical warfare items are periodically recovered at formerly used defense sites or active military installations.

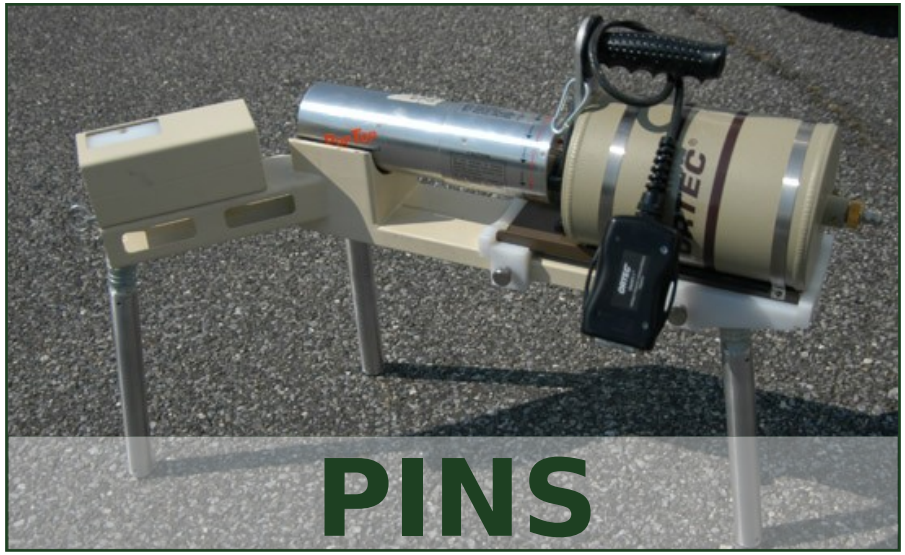
The U.S. Army Non-Stockpile Chemical Materiel Project was created in 1992 to support the assessment and treatment of chemical warfare materiel that was not part of the nation's chemical weapons stockpile.

The Non-Stockpile Project puts safety first, protecting our personnel, the surrounding
communities and the environment.



Proven technologies are the important first step to safely identifying obsolete chemical
materials without opening or disturbing them.

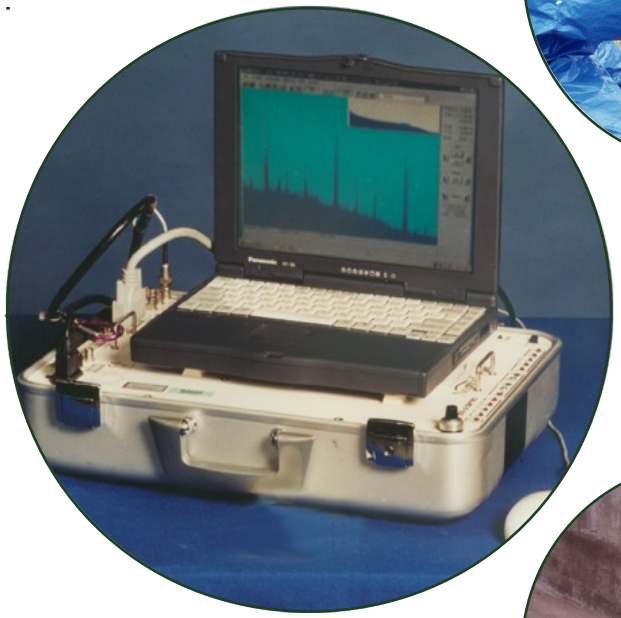
The Mobile Munitions Assessment System provides the resources to analyze munitions with unknown contents near their recovery sites, minimizing transportation. This mobile system uses a variety of non-intrusive analytical devices.



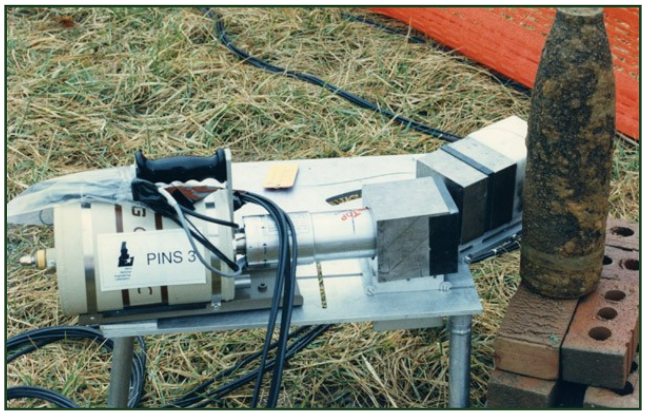
These assessment systems include the Portable Isotopic Neutron Spectroscopy System, the

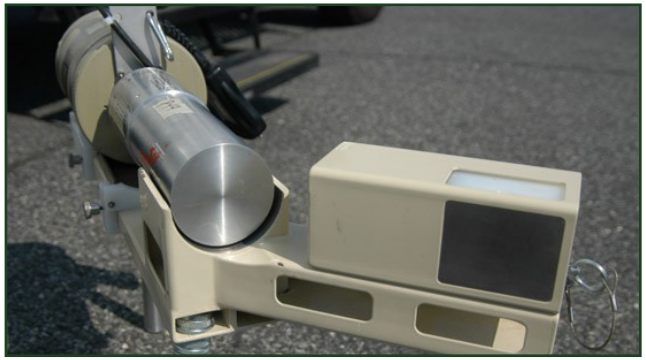
Digital Radiography and Computed Tomography System, and the Raman Spectrometer.

PINS



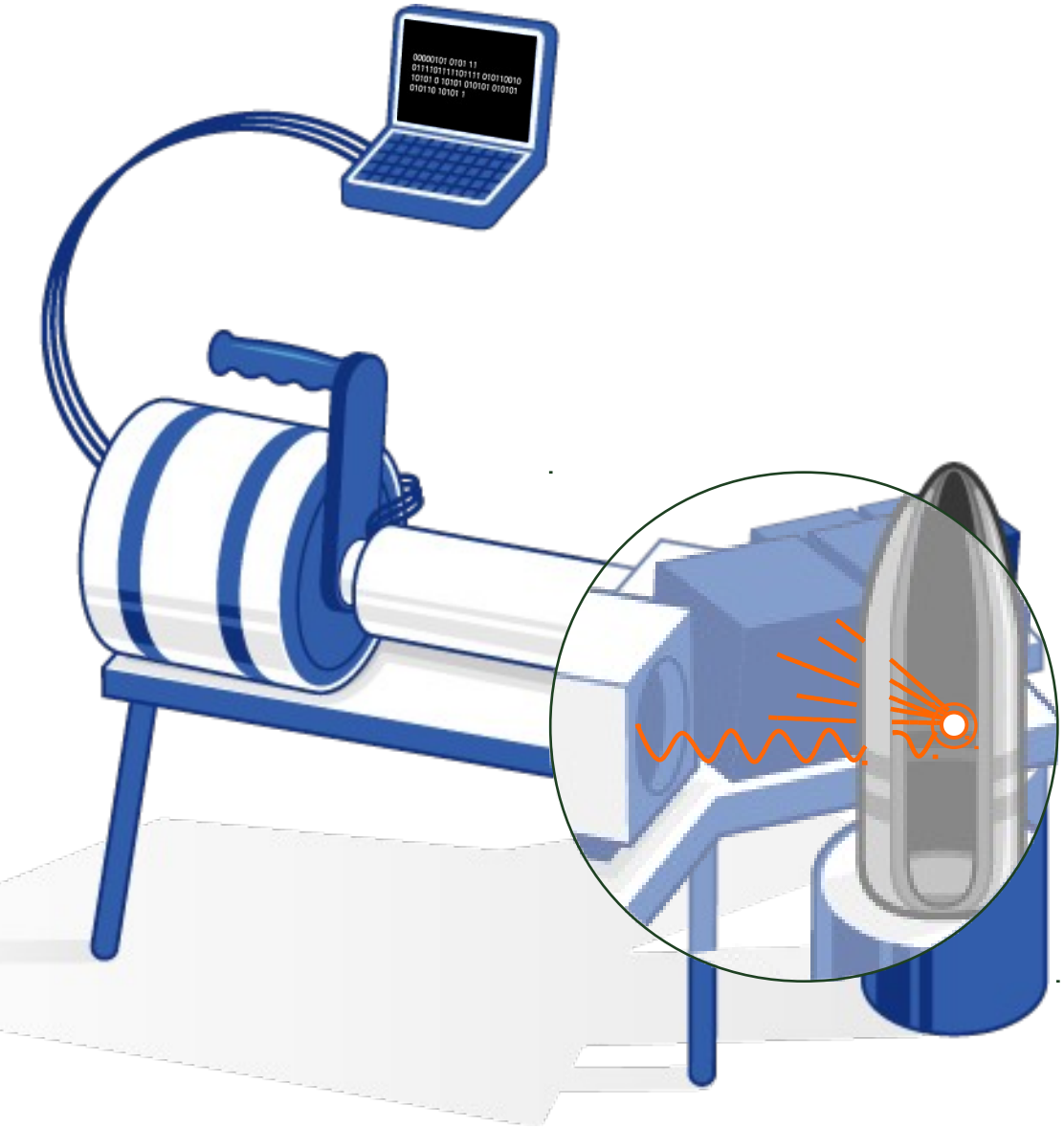
PINS, short for Portable Isotopic Neutron Spectroscopy System, accurately detects the presence
of chemical elements.





PINS uses neutron particles to produce a unique energy spectrum given off by chemicals inside

a munition.



1. PINS uses atomic particles called neutrons.

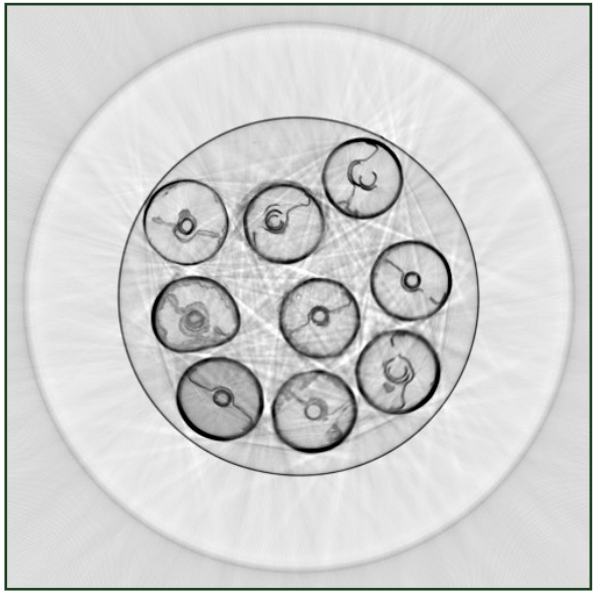
2. Neutrons penetrate container walls and interact with atomic nuclei. The nuclei emit radiation called gamma rays.

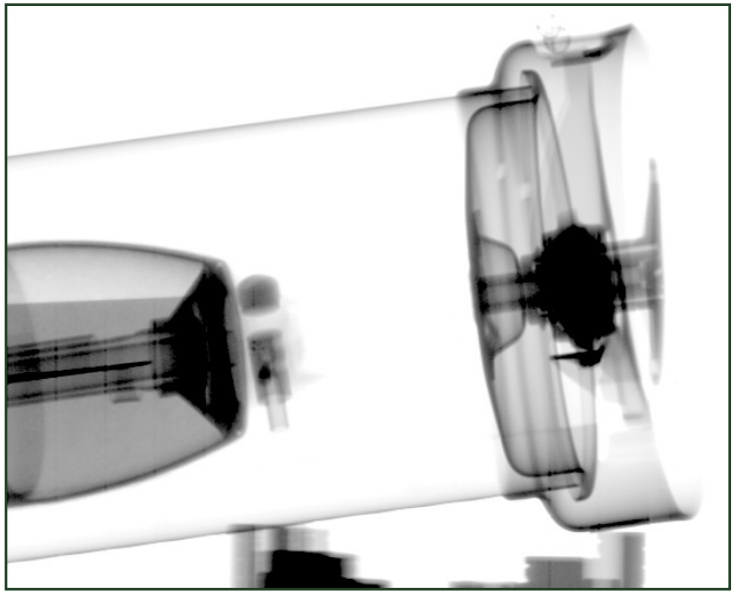
3. The energy intensity pattern, or spectrum, of these gamma rays is unique for each chemical element.

4. Analysis of a recovered item's unique gamma ray spectrum allows PINS to identify key chemical elements.

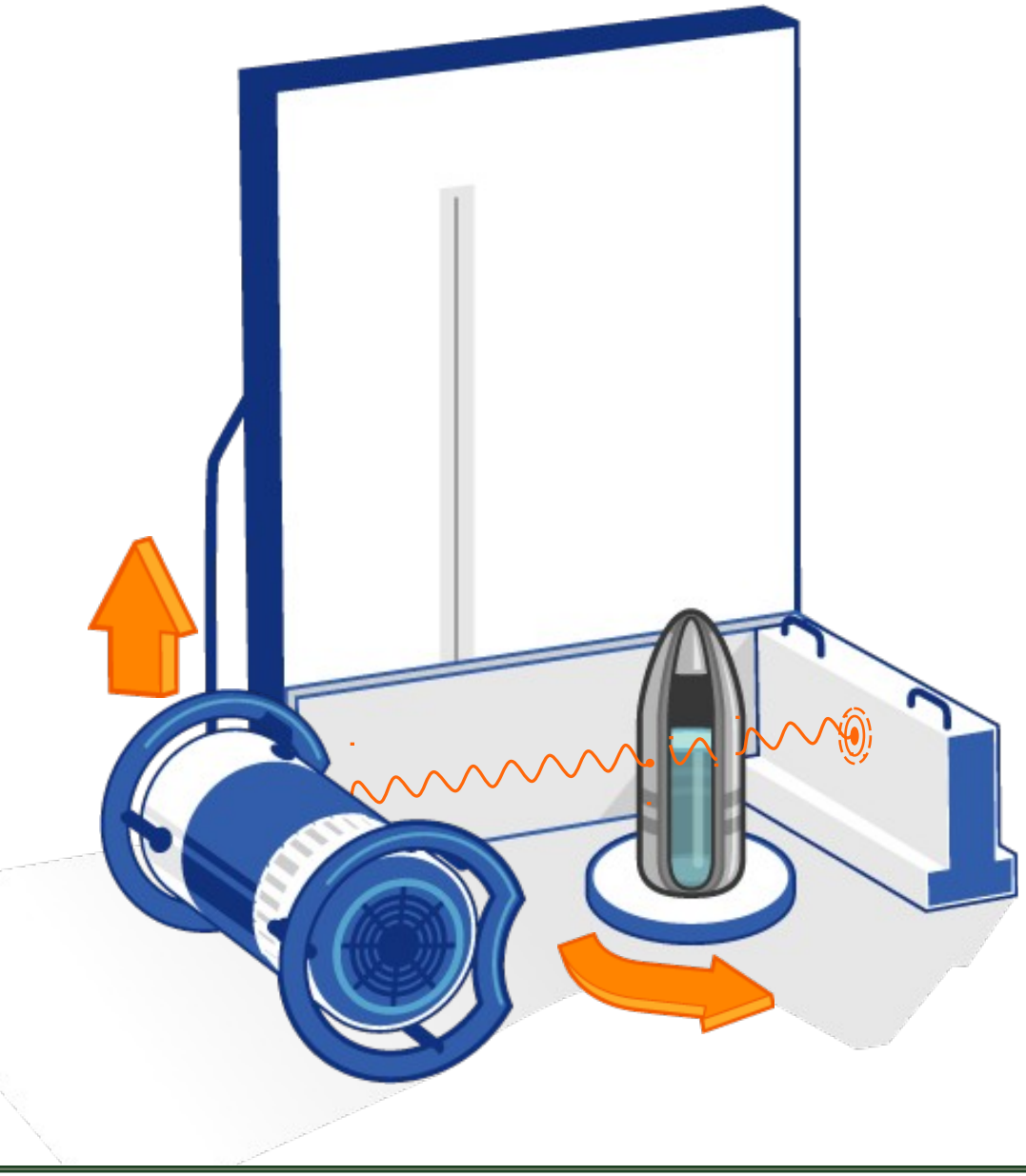
DRCT

The Digital Radiography and Computed Tomography System harnesses the power of high tech digital pictures to identify munitions contents and explosive potential. DRCT uses x-ray photography to produce high-quality images.





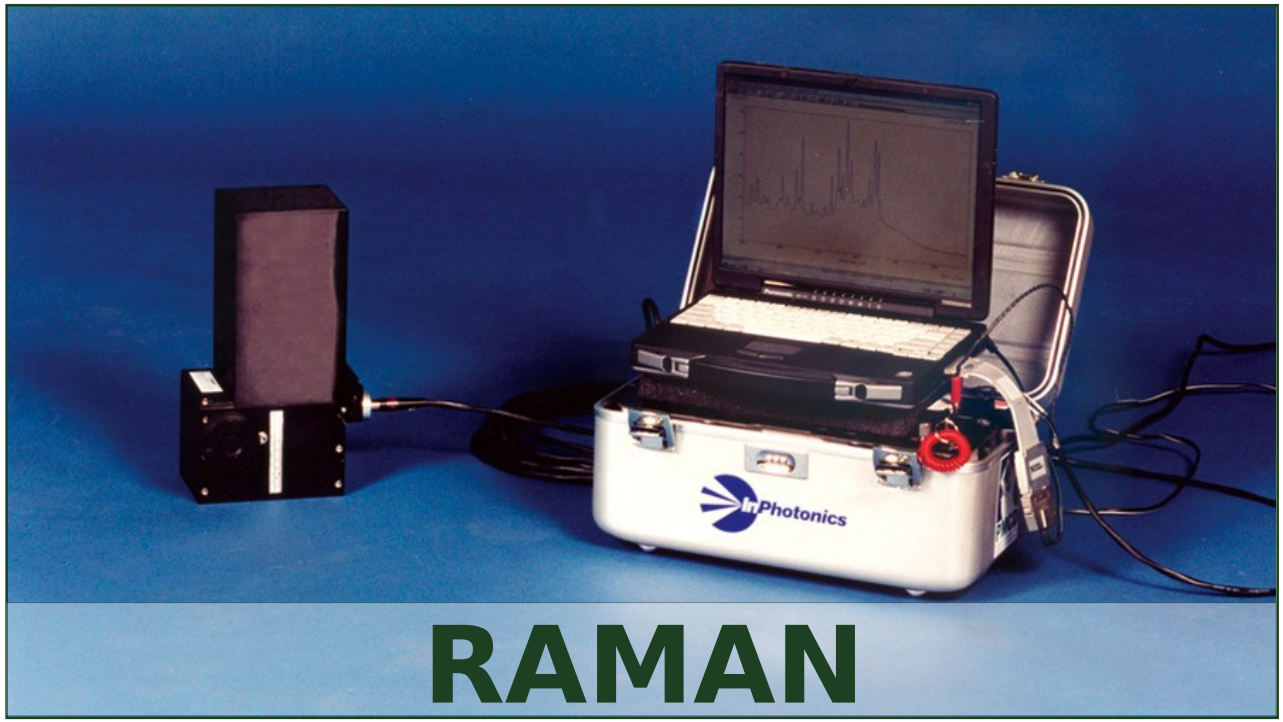
These real time images may be one-dimensional, similar to a typical x-ray, or a two-dimensi
image that shows “slices” of the item, or a full, 360 degree, three-dimensional image.

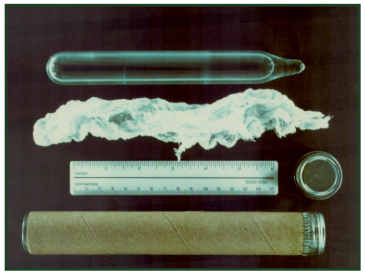


1. Similar to getting an X-ray in the hospital, DRCT uses an X-ray generator and detector to vertically scan a suspect chemical munition, on a platform.

2. The scan produces a digital view of the munition's interior to show if the munition contains a liquid fill and explosive components.

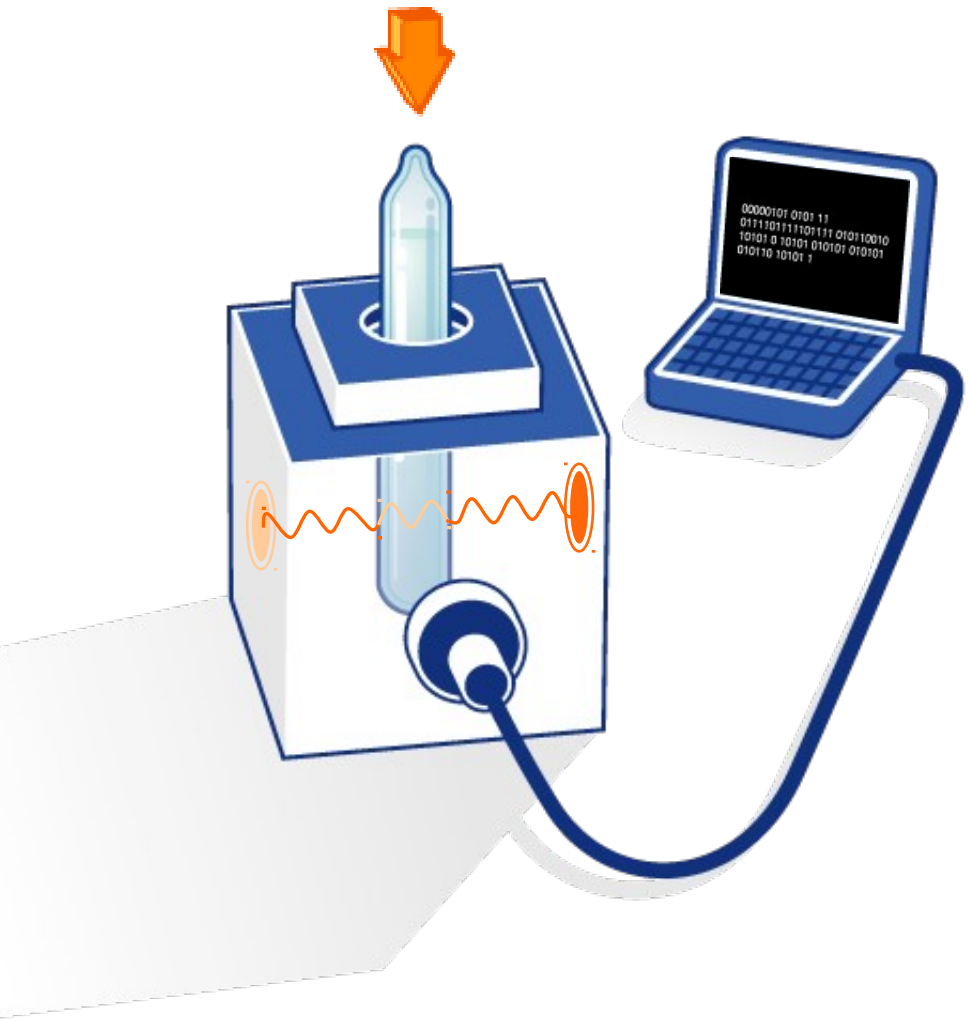
3. The DRCT can produce a conventional digital X-ray image, a tomographic (two-dimensional X-ray) image and a full 3-D image, similar to a CAT scan.





The Raman Spectrometer is the third important tool that can analyze contents without opening containers. Using a fiber optic probe and a laser, it identifies the contents of Chemical Agent Identification Sets, glass vials containing various agents and industrial chemicals once used to

As a laser light passes through the glass containers in Identification Sets, the unique chemical signature assists operators in determining the contents.

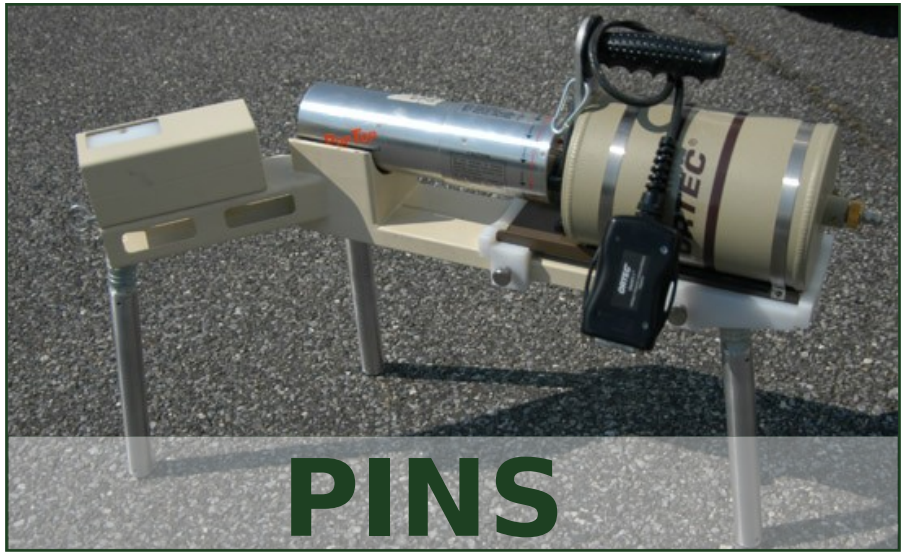


1. The fiber-optic probe is placed against the glass wall of the CAIS item, directing a laser light.

2. As the laser light passes through the glass wall, it produces a unique spectrum signature.

3. Operators then look for distinctive chemical signatures from the spectrum.

4. Operators send the information from the spectrometer to the computer for analysis.

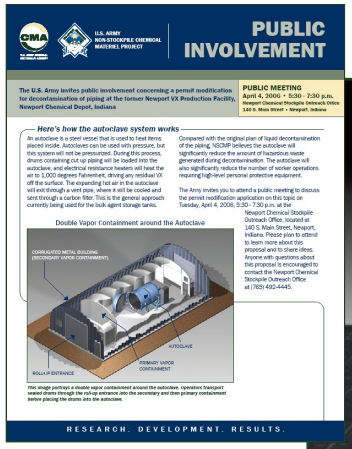


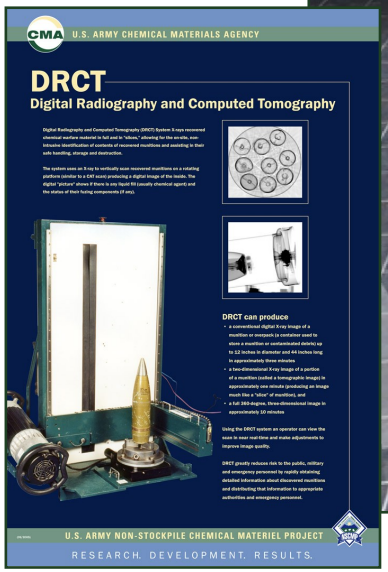
Together, these flexible assessment technologies aboard the MMAS are critical to the safe handling and disposal of recovered chemical items. Identifying the contents and explosive condition of a recovered item assists in safe storage, treatment and disposal

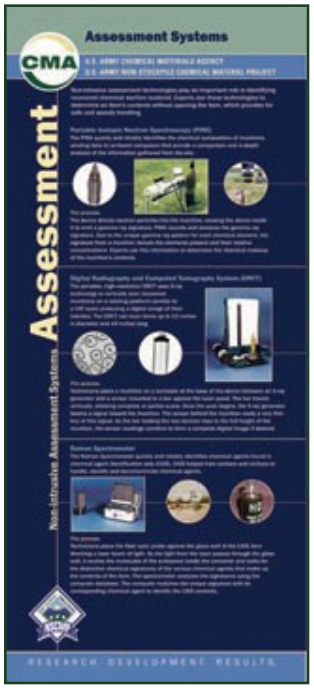
MMAS serves as a comprehensive command center, equipment storage area and weather monitoring system. It transmits data back to headquarters for analysis and can remain on site for months, with a constant power supply and redundant computer systems

If you ever suspect you have encountered chemical warfare materiel, stop and move away

from the items, evacuate the immediate area and call 911.


PUBLIC INVOLVEMENT
U.S. ARMY NON-STOCKPILE CHEMICAL MATERIEL PROJECT
The U.S. Army invites public involvement concerning a permit modification for decontamination of piping at the former Newport VX Production Facility, Newport Chemical Depot, Indiana
PUBLIC MEETING
April 4, 2006 • 5:30 - 7:30 p.m.
Newport Chemical Stockpile Outreach Office
140 S. Main Street • Newport, Indiana
Here's how the autoclave system works
Double Vapor Containment around the Autoclave
RESEARCH. DEVELOPMENT. RESULTS.





The Non-Stockpile Project leads the nation in disposing of recovered chemical materiel in a
safe, environmentally responsible manner.

For more information contact

U.S. ARMY CHEMICAL MATERIALS AGENCY

NSCMP Public Affairs Office

(410) 436-3629

(800) 488-0648

WWW.CMA.ARMY.MIL/NSCMP.ASPX